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Analysis of Joint Channel Coexistence Time at Space-Diversity Radio Reception of Meteor Reflections

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Abstract

IEEE The paper examines a possibility of joint reception of radio reflections from same meteor trails simultaneously at two spaced receivers. A refined simulation of a joint reception area of meteor radio reflections on the basis of a diffraction theory of oblique scattering of radio waves off ionized meteor trails is performed for radio links of moderate (500 km) and medium (1000 km) lengths. The obtained results may be particularly useful for territory planning of meteor burst communication networks with spatial division of subscribers (SDMA technology). The simulated joint reception areas also characterize an interception probability of messages. This knowledge is especially important in designing highly-secure meteor burst communications such as Meteor Key Distribution systems intended for creating of two identical copies of a shared secret key at both sides of meteor radio link.

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Keywords

Atmospheric modeling, Correlation, Geometry, meteor burst communications, Probes, Radio link, Radio propagation, Receivers, Reflection, reflection, space-diversity radio reception